

Listing of the Claims

1. (original) A method for forming via or contact holes with improved aspect ratios by using deep UV photoresist comprising the steps of:

providing a pre-processed semiconductor substrate;

depositing a Si-containing etch stop layer on top of said substrate;

depositing an oxide layer on said etch stop layer;

depositing a deep UV photoresist on top of said oxide layer;

curing said deep UV photoresist with UV radiation for at least 1 minute;

defining openings for said via or contact; and

etching said openings forming said via or contact holes.

2. (original) A method for forming via or contact holes with improved aspect ratios by using deep UV photoresist according to claim 1 further comprising the step of etching said openings to form via or contact holes having an aspect ratio of at least 8.

3. (original) A method for forming via or contact holes with improved aspect ratios by using deep UV photoresist according to claim 1 further comprising the step of depositing said Si-containing etch stop layer with a material selected from the group consisting of Si_3N_4 , SiON and SiC.
4. (original) A method for forming via or contact holes with improved aspect ratios by using deep UV photoresist according to claim 1, wherein said oxide layer deposited is an inter-level-dielectric (ILD) layer.
5. (original) A method for forming via or contact holes with improved aspect ratios by using deep UV photoresist according to claim 1 further comprising the step of curing said deep UV photoresist with UV radiation for a time period between about 1 minute and about 10 minutes.
6. (original) A method for forming via or contact holes with improved aspect ratios by using deep UV photoresist according to claim 1 further comprising the step of curing said deep UV photoresist with UV radiation for a time period between about 1 minute and about 10 minutes at a temperature of at least 100°C.

7. (original) A method for forming via or contact holes with improved aspect ratios by using deep UV photoresist according to claim 1 further comprising the step of reducing fluorocarbon polymer formation from said deep UV photoresist by curing with UV radiation.

8. (original) A method for forming via or contact holes with improved aspect ratios by using deep UV photoresist according to claim 1 further comprising the step of removing said Si-containing etch-stop layer.

9. (currently amended) A method for forming a large aspect ratio hole in an insulating material layer on a semi-conducting substrate comprising the steps of:

providing a pre-processed semi-conducting substrate having an etch-stop layer deposited on top;

depositing an insulating material layer on said etch-stop layer;

forming a deep UV photoresist layer on top of said insulating material layer;

irradiating said deep UV photoresist layer with UV radiation for at least 1 minute;

defining an opening for a hole;

etching a said hole having an aspect ratio of larger than 8 in said insulating material layer by using said deep UV photoresist layer; and

removing said etch-stop layer in said etched hole.

10. (original) A method for forming a large aspect ratio hole in an insulating material layer on a semi-conducting substrate according to claim 9 further comprising the step of forming the hole with an aspect ratio between about 8 and about 20.

11. (original) A method for forming a large aspect ratio hole in an insulating material layer on a semi-conducting substrate according to claim 9 further comprising the step of depositing said insulating material layer with an inter-level-dielectric (ILD) material.

12. (currently amended) A method for forming a large aspect ratio hole in an insulating material layer on a semi-conducting substrate according to claim 9 further comprising the step of depositing said insulating material layer in silicon oxide.

13. (original) A method for forming a large aspect ratio hole in an insulating material layer on a semi-conducting substrate according to claim 9 further comprising the step of depositing said etch-stop layer by a material selected from the group consisting of Si_3N_4 , SiON and SiC .

14. (original) A method for forming a large aspect ratio hole in an insulating material layer on a semi-conducting substrate according to claim 9 further comprising the step of irradiating said deep UV photoresist layer with UV radiation for a time period between about 1 minute and about 10 minutes.

15. (original) A method for forming a large aspect ratio hole in an insulating material layer on a semi-conducting substrate according to claim 9 further comprising the step of etching said hole for forming a via or a contact.